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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,684	10/16/2001	Dong-Gyu Kim	6192.0273.AA	3843

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McLean, VA 22102-4215

EXAMINER
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DI GRAZIO, JEANNE A

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/977,684

Applicant(s)

KIM, DONG-GYU

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 and 8-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6, 7 and 20-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
- 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claims*

Claims 6-7 and 20-25 are pending. Claims 1-5 and 8-19 are withdrawn from consideration per Applicant's election of Species B, Figure 4, Claims 6-7 and 20-25 drawn to a method for fabricating a liquid crystal display in the reply filed on April 29, 2004.

Claims 6, 21 and 24 are amended per Amendment of October 12, 2004.

### *Priority*

Priority to Korean Patent Application 2001-52829 (August 30, 2001) is claimed.

### *Claim Objections*

Claim 6 (as amended) is objected to because of the following informalities.

As to claim 6 (amended), the limitation “a black matrix” lacks proper antecedent basis as not having been properly introduced into the claim. Because “black matrix” is not given proper antecedent basis, any peripheral portion of any color filter that touches a black matrix will be construed to read on the claim including a black matrix that fills in gaps between color filters.

Appropriate correction is **required**.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent 5,568,293 (to Takao et al.).

As to claim 6 (amended), Takao teaches and discloses a liquid crystal display having trapezoidal color filters formed from a low-temperature curing polyamino resin having a photosensitive group (Title, entire patent). Referring to Figures 11A – 11F (illustrating a sequence of method steps in the formation of color filters) and ensuing explanation of Figures 11A – 11F, Takao has a blue colored resin material (112) coated onto a substrate then subsequent to the blue colored resin material (112) a green colored pattern is formed (115) partially overlapping with the blue pattern shape colored resin (112) layer and then further a red pattern colored resin layer (116) is formed to partially overlap with the blue pattern colored resin layer (112) and the green pattern colored resin layer (115)(Column 16, Example 3 and Column 17, Lines 1-67). The resulting sequential series of color filters is featured in Figures 4A and 11F for example. (Applicant's "sequentially forming a plurality of color filters neighboring each other on a substrate, each color filter having a flat central portion and a peripheral portion wherein the peripheral portion is tapered as advancing from an interface with the flat central portion toward the neighboring color filters"). As broadly interpreted, each color resin pattern has a peripheral

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portion that touches a black matrix (light intercepting layer 117 formed in conformity with gap between respective units of color pattern layers (Column 19, Lines 18-27).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 5,568,293 (to Takao et al.) and further in view of United States Patent 5,725,975 (to Nakamura et al.).

As to claim 7, Takao does not appear to explicitly specify patterning the color filter material by using a mask having a transparent pattern, a semitransparent pattern and an opaque pattern, wherein the semitransparent pattern is used for forming the peripheral portion of each color filter.

Nakamura teaches a gradation mask and process for the production of the masks of three different regions varying in transparency (please see Figure 5B). In region "c" of Figure 5B, the transmittance of light of a wavelength of 365 nm was 100% while in region "b" transmittance was about 10% (Column 6, Lines 30-37). Nakamura also teaches that this gradation mask is very suitable for the manufacturing of color filters comprising a plurality of colored pixels (Column 6, Lines 61-63). The teaching of Nakamura suggests that this type of gradation mask is suitable for

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the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks. Nakamura states that such a gradation mask can be produced "with high accuracy and efficiency and at a low cost (Column 2, Lines 24-29).

Nakamura is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to incorporate such a gradation mask into a process for color filter manufacturing to produce filters efficiently and at low cost.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Takao in view of Nakamura for the formation of color filters such that light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks (high efficiency and low cost).

Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 5,568,293 (to Takao et al.) and further in view of United States Patent 6,567,150 B1 (to Kim).

As to claim 20, Takao does not appear to explicitly specify the steps of forming a plurality of gate lines on the substrate, forming a plurality of data lines on the substrate, wherein

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the plurality of gate lines and the plurality of data lines define a plurality of pixel regions, forming a thin film transistor in each pixel region, the thin film transistor comprising a source electrode, a drain electrode and a gate electrode, and forming a pixel electrode in each pixel region, the pixel electrode connected to the drain electrode.

Kim teaches and discloses a liquid crystal display and method for its manufacture wherein a conventional liquid crystal display panel typically includes switching elements and bus lines for generating an electric field for driving the liquid crystal, pixel electrodes formed on a transparent substrate, the pixel electrodes are opposite to the common electrode formed on the color filter panel and which function to generate an electric field applied to the liquid crystal, signal bus lines that run along a column direction of an array of the pixel electrodes, and data bus lines that run along a row direction of the array of pixel electrodes, a thin film transistor (TFT) formed at the corner of the pixel electrodes which applies an electromagnetic field to the pixel electrode, and wherein a gate electrode of the TFT is connected with the signal / gate bus line and a source electrode is connected with the data / source bus line and a drain electrode of the TFT is connected to the pixel electrode (Column 1, Lines 50-67 and Column 2, Lines 1-3).

Kim is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to include the above elements into a liquid crystal display to apply appropriate electric fields to the display to drive the display.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Takao in view of Kim to apply appropriate electric fields to the display so that one could drive the display.

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As to claim 21 (amended), it may be presumed that a color filter overlaps a data line (Column 1, Lines 50-67 and Column 2, Lines 1-3).

As to claims 22 and 25, Takao illustrates, at least with reference to Figure 4A, peripheral portions of the color filters overlapping with peripheral portions of other color filters.

As to claim 23, Kim also discloses the steps of forming a black matrix on a substrate and common electrode on the plurality of color filters (Column 1, Lines 50-67 and Column 2, Lines 1-3).

As to claim 24 (amended), Takao illustrates each color resin pattern has a peripheral portion that touches a black matrix (light intercepting layer 117 formed in conformity with gap between respective units of color pattern layers (Column 19, Lines 18-27).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 6 is rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent 6,271,902 B1 (to Ogura et al.).

As to claim 6 (amended), Ogura has, with reference to Figures 3A-3G, the steps of sequentially forming a first coloring layer (red)(15), a second coloring layer (green)(18), and then a third coloring layer (blue)(20) onto a transparent substrate (1), each coloring layer has a



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flat central portion that can be readily seen in the figures and portions which taper in a direction approaching a neighboring coloring layer. Furthermore, each peripheral portion of each coloring layer overlaps with a black mask (3)(Applicant's "sequentially forming a plurality of color filters neighboring each other on a substrate, each color filter having a flat central portion and a peripheral portion placed on the black matrix, wherein the peripheral portion is tapered as advancing from an interface with the flat central portion toward the neighboring color filters").

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,271,902 B1 (to Ogura et al.) and further in view of United States Patent 5,725,975 (to Nakamura et al.).

As to claim 7, Ogura does not appear to explicitly specify patterning the color filter material by using a mask having a transparent pattern, a semitransparent pattern and an opaque pattern, wherein the semitransparent pattern is used for forming the peripheral portion of each color filter.

Nakamura teaches a gradation mask and process for the production of the masks of three different regions varying in transparency (please see Figure 5B). In region "c" of Figure 5B, the

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transmittance of light of a wavelength of 365 nm was 100% while in region “b” transmittance was about 10% (Column 6, Lines 30-37). Nakamura also teaches that this gradation mask is very suitable for the manufacturing of color filters comprising a plurality of colored pixels (Column 6, Lines 61-63). The teaching of Nakamura suggests that this type of gradation mask is suitable for the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks. Nakamura states that such a gradation mask can be produced “with high accuracy and efficiency and at a low cost (Column 2, Lines 24-29).

Nakamura is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to incorporate such a gradation mask into a process for color filter manufacturing to produce filters efficiently and at low cost.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Ogura in view of Nakamura for the formation of color filters such that light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks (high efficiency and low cost).

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Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,721,902 B1 (to Ogura et al.) and further in view of United States Patent 6,567,150 B1 (to Kim).

As to claim 20, Ogura does not appear to explicitly specify the steps of forming a plurality of gate lines on the substrate, forming a plurality of data lines on the substrate, wherein the plurality of gate lines and the plurality of data lines define a plurality of pixel regions, forming a thin film transistor in each pixel region, the thin film transistor comprising a source electrode, a drain electrode and a gate electrode, and forming a pixel electrode in each pixel region, the pixel electrode connected to the drain electrode.

Kim teaches and discloses a liquid crystal display and method for its manufacture wherein a conventional liquid crystal display panel typically includes switching elements and bus lines for generating an electric field for driving the liquid crystal, pixel electrodes formed on a transparent substrate, the pixel electrodes are opposite to the common electrode formed on the color filter panel and which function to generate an electric field applied to the liquid crystal, signal bus lines that run along a column direction of an array of the pixel electrodes, and data bus lines that run along a row direction of the array of pixel electrodes, a thin film transistor (TFT) formed at the corner of the pixel electrodes which applies an electromagnetic field to the pixel electrode, and wherein a gate electrode of the TFT is connected with the signal / gate bus line and a source electrode is connected with the data / source bus line and a drain electrode of the TFT is connected to the pixel electrode (Column 1, Lines 50-67 and Column 2, Lines 1-3).

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Kim is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to include the above elements into a liquid crystal display to apply appropriate electric fields to the display to drive the display.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Ogura in view of Kim to apply appropriate electric fields to the display so that one could drive the display.

As to claim 21 (amended), it may be presumed in Kim that a color filter overlaps a data line (Column 1, Lines 50-67 and Column 2, Lines 1-3).

As to claims 22 and 25, Ogura illustrates, at least with reference to Figure 4, peripheral portions of the color filters overlapping with peripheral portions of other color filters.

As to claim 23, Kim also discloses the steps of forming a black matrix on a substrate and common electrode on the plurality of color filters (Column 1, Lines 50-67 and Column 2, Lines 1-3).

As to claim 24 (amended), Ogura illustrates each color resin pattern has a peripheral portion that touches a black matrix (Figure 4).

### ***Response to Arguments***

Applicant's arguments filed October 12, 2004 have been fully considered but they are not persuasive.

The Examiner has carefully considered Applicant's points made in Applicant's arguments. However, said arguments are not found to be persuasive for the following reasons.

I. Arguments with Respect to United States Patent 5,568,293 (to Takao et al.).

First, it is respectfully noted that Applicant refers to Applicant's Figure 2 as illustrating the claimed subject matter of claim 6. However, it is respectfully pointed out that Applicant has elected Species B, Claims 6-7 and 20-25 readable thereon drawn to a method for fabricating a liquid crystal display in the reply filed on April 29, 2004. Species B corresponds to Figure 4 and not to Figure 2.

Applicant argues that Takao fails to disclose or suggest "a peripheral portion placed on a black matrix" as claimed (Remarks at page 11). In this note, Applicant argues that it is logically impossible that the colored patterns are formed on the light intercepting layer because the light intercepting layer is formed after the colored patterns are formed.

It is respectfully pointed out that the Examiner has noted in the previous Office Action (claim objections) an objection to claim 6 as not having properly introduced a / the black matrix into the claim. This objection is still maintained. Claim 6 recites a sequence for forming color filters with respect to a given color. The claim does not recite a step of forming a / the black matrix. Where the black matrix is formed with respect to the sequence of color filters is unknown and is open to interpretation.

The claim recites that a peripheral portion of the color filter is placed on a / the black matrix. Even if a light intercepting layer is formed in the gaps between the colored patterns, the peripheral portion of the colored patterns is still considered to be on a / the light intercepting layer.

“On” means a position in contact with or in proximity to something else. Thus, as noted, even if the light intercepting layer is formed in gaps between colored patterns, the peripheral part of the colored patterns is still on the light intercepting layer.

## II. Arguments with Respect to United States Patent 6,271,902 B1 (to Ogura et al.).

First, it is respectfully noted that Applicant refers to Applicant’s Figure 2 as illustrating the claimed subject matter of claim 6. However, it is respectfully pointed out that Applicant has elected Species B, Claims 6-7 and 20-25 readable thereon drawn to a method for fabricating a liquid crystal display in the reply filed on April 29, 2004. Species B corresponds to Figure 4 and not to Figure 2.

Applicant argues that “[i]n Fig. 3G of Ogura, the color filter B has a flat central portion and a peripheral portion. The peripheral portion becomes *thicker* as advancing from the interface with the flat central portion to the portion where the color filter B overlaps the color filter G. Then, the peripheral portion is tapered as advancing from the portion where the color filter B overlaps the color filter G.” (Remarks at page 11).

If, as Applicant notes, that the peripheral portion is tapered as advancing from the portion where the color filter B overlaps the color filter G, then, such is consistent with what Applicant claims in claim 6. The claim is still considered to read on the applied reference.

Please also see Figure 16 I which shows a conventional process for manufacturing color filters in which color filter B is tapered.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289.

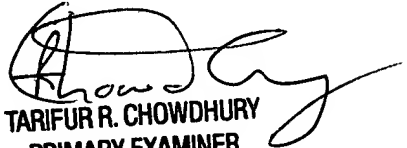
The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio  
Patent Examiner  
Art Unit 2871

JDG

  
TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER